



Telecom Malaysia centralizes TM WiFi Subscriber Data

Customer Case Study: Telecom Malaysia



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Telekom Malaysia R&D

Telekom Malaysia is the largest integrated telecommunications company in Malaysia, and one of Asia's leading communications companies. The core business is in Internet, multimedia, data and fixed-line services.

TM Research and Development Sdn. Bhd., a subsidiary of Telekom Malaysia, is a technology company that supports Telekom Malaysia's business through state of the art research and development.

The Business Challenge

TM R&D had to build a centralized AAA system to handle authentication and accounting of users to accommodate rapid growth in its user base that require mobility, and provide reliable access to a number of new network services. The centralized AAA infrastructure would require a solid backend subscriber database. It also meant that subscriber information that was stored in different systems would now be centralized in the new backend database.

Subscriber databases typically store user profiles and user activity, and this data is accessed when users authenticate and try to access their services. Network activity such as session times, IP address, network traffic, etc. is recorded by the accounting system, and can be used for e.g., billing purposes. User data is typically read-intensive, while accounting data is write-intensive. As the number of users and the amount of service data to be collected grows, the choice of datastore becomes very important.

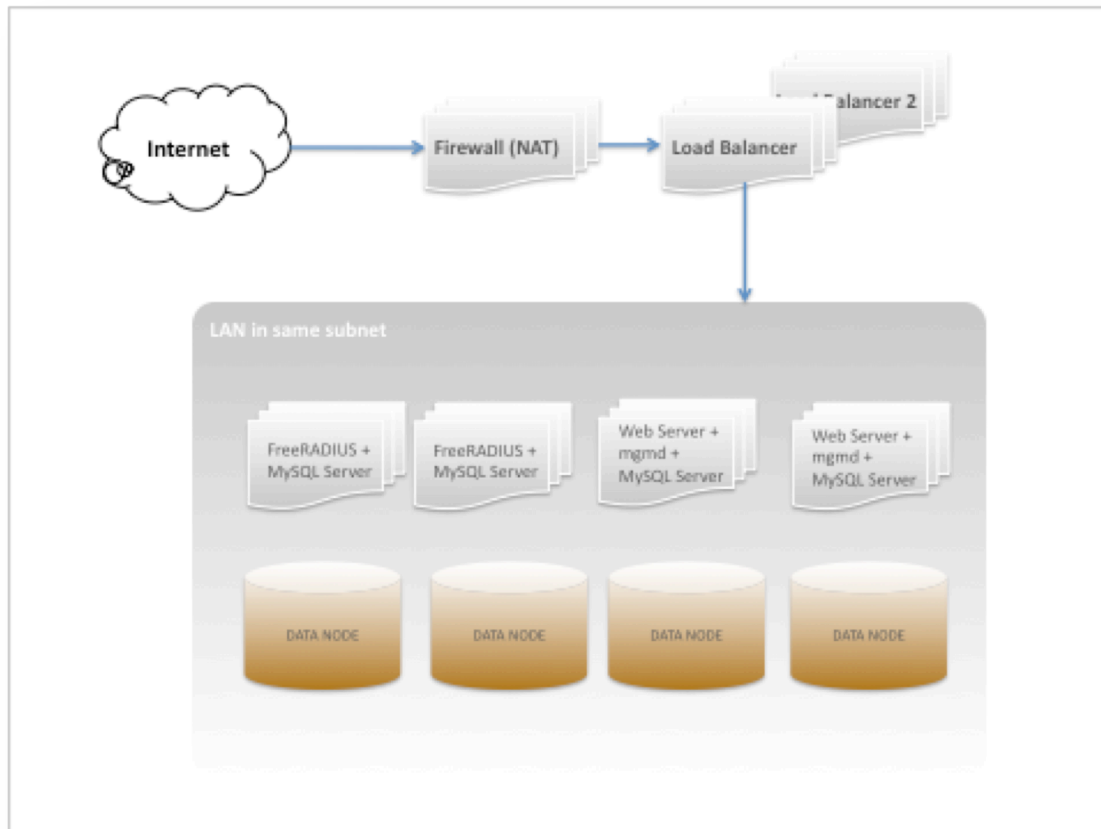
The project team had to deliver a typical telecom-type SLA:

- 99.999% availability
- No loss of data
- Horizontal scalability (load spread across multiple servers) with an initial dimensioning of at least 100k concurrent users
- Minimal administration and management overhead
- Low total cost of ownership (TCO)

The ClusterControl™ solution

MySQL® Cluster was selected as the backend datastore in order to provide 99.999% availability.

The technical team used the Severalnines Configurator for MySQL® Cluster (<http://www.severalnines.com/configurator>) to generate a deployment package for their on-premise MySQL® Cluster installation. The deployment package completely automated the deployment of the database cluster.



Once the infrastructure was in place, it was important to manage and monitor the database cluster with as low overhead as possible. Any downtime would affect the authentication service and all services making use of it. Therefore, it was important to continuously monitor the database and get alerted whenever there was a problem.

ClusterControl™ could provide a single, consolidated view of database health as well as the underlying platform (OS, hardware, network). Coverage of all these would help to accurately isolate source of problems. Management was also simplified. Backups could be scheduled from a web user interface. This enabled the DBA to focus on more important tasks such as architecture design and performance tuning.

Once deployed in a Telco environment, it is important for the system to run in an autonomous fashion, requiring as little management overhead as possible. In cases where the database cluster does not handle certain node restarts, these need to be handled by an external availability manager in order to avoid manual intervention. Also, granular control down to individual nodes of the cluster is important so as to quickly troubleshoot any issues. Problems can be external to the database, e.g. the OS or the underlying hardware, or it could be related to bad performing queries.

The ClusterControl™ Query Analyzer was a useful tool to identify slow running queries. Performance Probes could be used to benchmark slow queries. Improvements to the queries could be quickly tested to find out average response times, 95 percentile response times and throughput.

DASHBOARD TOOLS LIBRARY CONTACT BUGS GLOBAL SETTINGS

Cluster 'ClusterTest'

- Data nodes
 - 91.123.200.92
 - 91.123.195.184
- Mgmt nodes
 - 91.123.200.116
 - 91.123.201.39
- MySQL Servers
 - 91.123.200.116
 - 91.123.201.39

Performance Management - ClusterTest

[Edit](#)

Username	Password	Database	DB Connections	Runtime (secs)	Interval between executions
root	password	sakila	16	30	0

Probe 1
Query: Select 1
Active: Yes

Hostname	DB Connections	Connection Pool	Execution Count	Rows returned	Avg Response Time (us) (stdev)	95th Percentile (us)	Throughput (tps) (stdev)	Last updated
91.123.200.116	16	8	33824	1	966 (19132)	797	17457 (4274)	2011-07-21 11:43:57
91.123.201.39	16	8	99038	1	1567 (80754)	137	50935 (4800)	2011-07-21 11:43:17
TOTAL	16	8	132862	2	1266.5(avg)	467	68392	-

Probe 2
Query: CALL film_not_in_stock(2,3,@count)
Active: Yes

Hostname	DB Connections	Connection Pool	Execution Count	Rows returned	Avg Response Time (us) (stdev)	95th Percentile (us)	Throughput (tps) (stdev)	Last updated
91.123.200.116	16	8	3589	0	8044 (16095)	20988	1852 (132)	2011-07-21 11:44:29
91.123.201.39	16	8	8072	0	3843 (6613)	8161	4166 (174)	2011-07-21 11:43:48
TOTAL	16	8	11661	0	6243.5(avg)	15041.5	6018	-

Probe 3
Query:
Active: No
Err no:
Error:

Hostname	DB Connections	Connection Pool	Execution Count	Rows returned	Avg Response Time (us) (stdev)	95th Percentile (us)	Throughput (tps) (stdev)	Last updated
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Probe 4

Cluster - ClusterTest

- [View nodes](#)

Storage Layer

- [Cluster log](#)
- [Cluster statistics](#)
- [Memory usage](#)

SQL Layer

- [Processlist \(global\)](#)
- [Query analyzer \(global\)](#)

Management

- [Alarms \(2\)](#)
- [Backups](#)
- [Config mgmt](#)
- [Host mgmt](#)
- [Messages \(0\)](#)
- [Node mgmt](#)
- [Performance mgmt](#)
- [Process mgmt](#)
- [Scale](#)
- [Schema mgmt](#)
- [Upgrade](#)

Troubleshooting

- [Logs](#)

Administration

- [Email notifications](#)
- [Cluster settings](#)

Benefits

With the help of Severalnines, Malaysia Telekom R&D were able to:

- Build a highly available database cluster in a very short time
- Horizontally scale database nodes at the push of a button
- Roll out upgrades, patches and new database features at the simple push of a button
- Put a management infrastructure in place to automate database monitoring and administration
- Make quick decisions in minutes by having access to quick and actionable data from a single management dashboard
- Lower total cost of ownership with open source software and commodity off-the-shelf hardware

Customer Quote

“ClusterControl™ was the best available solution for monitoring and managing our MySQL® Cluster backend. It delivered the automation necessary to meet the needs of our telco-grade environment,” says Yeoh Chun Yeow, Senior Researcher at Telekom Malaysia R&D. “Thanks to these capabilities, we could deliver a telco-grade system without paying the telco price”.

About Severalnines

Severalnines provides software for easily usable, highly available and auto scalable cloud database platforms. Built upon well-established open-source software, Severalnines has created state of the art products that enable customers to more efficiently build their clustered database platforms, either on premise or in the cloud, hence lowering capital expenditures as well as increasing productivity and innovation.

Severalnines is recognized by thousands of organizations globally, with its products being used in different applications in industries spanning from online gaming to telecom and finance.

Severalnines' flagship product, ClusterControl™, enables customers to Deploy, Manage, Monitor and Scale their clustered database platforms, free from the complexity and learning curves associated with shared-nothing database clusters.

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